

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: STP-0002-00(638) Henry
P. I. No.: 0002638
Eagles Landing Parkway

OFFICE: Engineering Services

DATE: February 26, 2008

FROM: Brian Summers, P.E., Project Review Engineer *REW*

TO: Ben Buchan, P.E. State Urban Design Engineer

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. Incorporate alternatives recommended for implementation to the extent reasonable in the design of the project.

ALT No.	Description	Savings PW & LCC	Implement	Comments
A-10	Reduce the mainline outside shoulder width from 16' to 12'	\$252,000	No	There are numerous Underground Utilities as well as Aerial Utilities that will need to use the wider shoulder.
A-9 & A-10	Eliminate the dual 4' Bike Lanes and construct a 10' Multi-Use Path on the eastbound shoulder and reduce the westbound shoulder width from 16' to 12'	\$490,000	No	This project ties to projects on each end that have 4' Bike Lanes in the Roadway. The Bike Lanes are needed on this project for consistency and to provide better connectivity to the adjacent projects.
B-3	Construct the full six-lane roadway section now	-\$1,149,000 (Cost Increase)	No	The corridor is only modeled for 4 lanes in the Regional Transportation Plan.
C-1(A)	Construct two separate Bridge Structures over Norfolk Southern Railroad	\$659,000	No	Henry County is funding the additional width required on the bridges.
C-1(B)	Construct two separate Bridge Structures over Pates Creek	\$1,307,000	No	Henry County is funding the additional width required on the bridges.

ALT No.	Description	Savings PW & LCC	Implement	Comments
C-2	Review the need to raise the Pates Creek Bridge	\$570,000	Yes	This should be done.
C-4	Remove the Bike Lanes from the Roadway Bridges and place them on a separate Multi-Use Bike Path Bridge	\$260,000	No	This project ties to projects on each end that have 4' Bike Lanes in the Roadway. The Bike Lanes are needed on this project for consistency and to provide better connectivity to the adjacent projects.
F-1	Construct a single span bridge with "U" shaped MSE Walls instead of a three span bridge over the Railroad (separate two-lane Bridge Structures)	\$344,000	No	The Bridge Plans have already been sent to the Railroad for review and have been sent back to the Design Consultant to address the recommended changes prior to approval.
A-3	Check the Roadway Superelevation transition at the Norfolk Southern Railroad Bridge	Design Suggestion	No	This VE Alternative would cause a superelevation transition across the bridge which would make it somewhat more difficult to construct.
A-5(1)	Review crossroad access at Trade Center Parkway	Design Suggestion	No	This is beyond the scope of this project and is being considered by Henry County for some point in the future.
A-5(2)	Review crossroad access at Four M Way	Design Suggestion	Yes	This should be done.
K-3	Relocate the Multi-Use Bike/Pedestrian Path from the eastbound shoulder to a location off of the roadway for a portion of the project	Design Suggestion	No	This project ties to projects on each end that have 4' Bike Lanes in the Roadway. The Bike Lanes are needed on this project for consistency and to provide better connectivity to the adjacent projects.
B-8	Review the need to replace the new four-lane roadway section east of S.R. 42	Design Suggestion	No	The area in question overlaps a section of East Lake Parkway Extension that was recently completed and is necessary to make a slight alignment correction and to complete the raised median that was omitted under that project.

A meeting was held on February 13, 2008 to discuss the above recommendations. Roque Romero-Muniz with Henry County, Chris Marsengill with McGee Partners, Ben Buchan, Darrell Richardson, Jan Hilliard, and Francis Alomia with Urban Design, and Brian Summers, Ron Wishon and Lisa Myers with Engineering Services were in attendance.

The results above reflect the consensus of those in attendance and those who provided input.

Approved: Darrell M. Ross Date: 2/29/08
Gerald M. Ross, P. E., Chief Engineer

BKS/REW

Attachments

c: Gus Shanine
Todd Long
Paul Liles
Bill Ingalsbe
Bill Duvall
Joe King
James Magnus
Darrell Richardson
Jan Hilliard
Francis Alomia
Alexis John
Ken Werho
Lisa Myers

PRELIMINARY FIELD PLAN REVIEW

PROJECT : STP-0002-00(638) COUNTY: HENRY

P.I. No.: 0002638 INSPECTION DATE: 7/26/07

PROJECT DESCRIPTION: EAGLES LANDING PARKWAY

UTILITY PLANS:

Electrical:	GPC DIST. & TRANSMISSION
Gas:	AGL
Sewer:	HCWSA
Water:	HCWSA & CCW
Telephone:	AT&T
Railroad:	NFS
Cable TV:	CHARTER
Other:	None

Special Provisions Required for Utilities:

- ☒ Utility Conflicts – All projects
- ☒ Insurance Protection of Utility Interests
- ☒ Insurance Protection of Railroad Interest

Spec for handling and disposal of hazardous material for existing asbestos concrete water line that has been abandoned.

General Utility Comments:

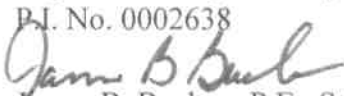
- ⇒ Plans have been sent to Utility Companies for review.
- ⇒ SUE services provided the existing utility information on 12-14-06.
- ⇒ Henry County will be responsible for reimbursable utility cost on this project as per PMA.
- ⇒ Estimated cost at this time is AT&T \$300,000 and GPC distribution \$200,000.
- ⇒ AT&T's reimbursable cost may be eliminated with reconfiguring the proposed storm drain at 285+50 left as discussed at PFPR.
1. Storm drain will be reconfigured in this area. Depth information will be requested from AT&T as soon as possible.
- ⇒ GPC's claim for reimbursement is by prior rights but no supporting documentation has been provided to date.

DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE



FILE STP-0002-00(638), Henry County
Eagle's Landing Parkway
P.I. No. 0002638
OFFICE Urban Design
DATE January 9, 2008

FROM 
James B. Buchan, P.E., State Urban Design Engineer

TO Brian Summers, P.E., Project Review Engineer

SUBJECT **VALUE ENGINEERING STUDY RECOMMENDATION
RESPONSES**

In accordance with current Department policy, a Value Engineering Study was completed for the referenced project. The total cost estimate for construction, right of way and reimbursable utility relocation is approximately \$40,885,000.00. The Value Engineering Study Team generated eight "Creative Ideas" and five "Design Suggestions" for consideration. The design team has reviewed each idea and suggestion, and offers the following recommendations regarding each.

Creative Ideas

Idea A-9: Eliminate the dual 4' bike lanes and replace with a single 10' multi-use path

*The design team's recommendation is to maintain the currently proposed dual 4' bike lanes, and to **not implement** this idea.*

This idea was evaluated during concept development. In fact at both the Initial Concept Team Meeting and the Concept Team Meeting, a 10' multi-use path with no concurrent roadway bike lanes was included in the conceptual layout and was discussed. However, the 4' bicycle lanes currently proposed in the project replaced the 10' multi-use path as a result of the Concept Team's concern over safety and continuity. The following was extracted from the meeting minutes of the Concept Team Meeting:

"GDOT representatives discouraged combining pedestrian and bicycle traffic on multi-use trails; they also discouraged transitioning between multiple types of facilities along the same corridor. The adjoining project to the west and the adjoining project to the east include bike lanes. This issue will be further researched by McGee Partners."

Further research by McGee Partners indicated that the Department's concern over leaving a "gap" in the bicycle lanes provided along the overall corridor (Flippen Road to SR 155) was a legitimate safety concern. The "gap" would require bicycle traffic to cross Eagle's Landing Parkway at two separate locations to utilize the multi-use path. Further, combining pedestrians with bicycle traffic is obviously less safe than providing separate facilities. Through

coordination with Henry County, it was decided that the additional cost associated with providing concurrent bike lanes was warranted by the increased safety provided.

Idea A-10: Reduce outside shoulder width from 16' to 12' on Eagle's Landing Parkway

The design team's recommendation is to not implement this idea.

The 12' shoulder typical section recommended in the VE Study was evaluated and compared to the 16' shoulder scenario during concept development. It was determined that the 16' shoulder scenario was actually more cost effective than the 12' shoulder scenario. The primary benefit of using 16' shoulders is that the required clear zone is provided on the shoulder. As a result, 3:1 fill slopes can be utilized, whereas, the 12' shoulder requires 4:1 fill slopes to meet clear zone requirements. Since the majority of the project is in fill, the earthwork volume saved by using 3:1 fill slopes instead of 4:1 fill slopes outweighs the increase in volume associated with providing 16' shoulders instead of 12' shoulders. In addition, 2:1 fill slopes are proposed where retaining walls are required. Changing these to 4:1 to meet the clear zone requirement of the 12' shoulder would negate the savings associated with retaining wall height referenced in the VE Study. Finally, the 16' shoulder scenario has a more narrow construction limit footprint than the 12' shoulder scenario. This too is a result of using 3:1 fill slopes instead of 4:1 fill slopes. Therefore, the 16' shoulder scenario actually reduces the right of way and easement impacts.

Secondary benefits of the 16' shoulders are realized by the community. The 16' shoulders shift pedestrians further away from vehicular and bicycle traffic on Eagle's Landing Parkway thereby improving pedestrian safety. In addition, the 16' shoulder scenario is more aesthetically pleasing than the 12' shoulder scenario since the 6' strip between the curb & gutter and sidewalk can be landscaped. The 6' strip may be grassed, and the community may elect to install low-level plantings in some areas. A 2' strip is less likely to support this vegetation, and is often paved with stamped concrete as a result. Therefore, from the community standpoint, the 16' shoulder scenario proposed is more desirable.

Idea B-3: Construct the full 6-lane roadway section throughout the entire length now

The design team's recommendation is to not implement this idea.

Simply stated, the full 6-lane roadway section cannot be constructed now because the current RTP includes a widening to only 4 lanes. Therefore, Eagle's Landing Parkway will be constructed as a 4-lane facility on a 6-lane footprint. The basic typical section includes four travel lanes and a 44' depressed median. During the design life of the project, the 44' depressed median will be replaced with two additional travel lanes and a 20' raised median. This will prevent the need to widen to the outside which would require extensive reconstruction of side streets, drainage structures, driveways, sidewalks, etc. This is the most that can be done to increase the cost effectiveness of this aspect of the project while respecting the constraints of the

Idea C-1(A): Construct dual, 2-lane bridge structures over Norfolk Southern Railroad

The design team's recommendation is to not implement this idea.

This idea was evaluated during concept development. In fact at both the Initial Concept Team Meeting and the Concept Team Meeting, dual, 2-lane bridges over the Norfolk Southern Railroad were included in the conceptual layout and were discussed. However, it was determined by the Concept Team that the full 6-lane bridges should be constructed to avoid costly widening in the future. Further analysis supports this decision.

The potential present-day cost savings of this idea, as presented in the VE Study, is significant. However, the traffic analysis indicates that the need for the full 6-lane roadway will be realized in fifteen to twenty years. The initial savings will be offset by the cost of widening the bridge in the near future.

The cost for widening a bridge, on a per-square-foot basis, is higher than the cost of constructing a new bridge. The following table compares the cost associated with constructing a 6-lane bridge with the cost of constructing dual, 2-lane bridges and widening to a 6-lane bridge in the future.

	Area (ft ²)	Unit Cost (per ft ²)	Cost Today	Interest & Inflation	Cost in 15 years
<u>6-Lane Bridge</u> 118'-5" X 192'	22,737	\$95	\$2,160,000		
<u>2-Lane Bridges</u> 2 - 42'-10" X 192'	16,447	\$95	\$1,562,000		
Initial Savings			\$598,000	5% per year for 15 years	\$1,243,000
<u>Widening</u> 36'-0" X 192'	6,912	\$110	\$760,000		\$1,581,000
Total Savings (Loss)			(\$162,000)		(\$338,000)

The initial savings is \$598,000. Assuming 5% interest and inflation for the next 15 years, the savings will not be enough to cover the cost of the widening. Therefore, over the design life of the project, there is no cost savings.

The calculations used to derive these costs differ slightly from those included in the VE Study. For example, the width for the dual bridge option in the VE study is 40'-10". The width used herein is 42'-10", and was calculated based on the following parameters:

1'-2 ½" parapet	6'-0" sidewalk
2'-0" shoulder	4'-0" bike lane
24'-0" two travel lanes	4'-0" inside shoulder
1'-7½" barrier	

The widening width was calculated as $118'-5" - (2)(42'-10") + (2)(1'-7\frac{1}{2}") = 36'-0"$.

Another complication that must be considered at this site is maintenance of traffic and construction staging. There is simply not enough room, with the currently proposed alignment, to build the entire width of one of the dual bridge. Only a portion of the left bridge could be constructed while the existing bridge is in service. The right bridge and the remainder of the left bridge would be built in the second stage of construction. Due to this staging requirement, the dual bridge option would not reduce construction time as indicated in the VE Study.

Other factors that must be considered include design costs of the future widening as well as costs associated with acquiring an additional construction easement from Norfolk Southern Railroad. These factors coupled with those outlined above were discussed and evaluated by the design team, GDOT and Henry County. Henry County has determined that the benefits of constructing the full 6-lane bridge as part of this project warrant the increased construction costs.

Idea C-1(B): Construct dual, 2-lane bridge structures over Pates Creek

The design team's recommendation is to not implement this idea.

This alternative was evaluated during concept development. In fact at both the Initial Concept Team Meeting and the Concept Team Meeting, dual, 2-lane bridges over Pates Creek were included in the conceptual layout and were discussed. However, it was determined by the Concept Team that the full 6-lane bridges should be constructed with the project to avoid costly widening in the future. Further analysis supports this decision.

The potential present-day cost savings of this idea, as presented in the VE Study, is significant. However, the traffic analysis indicates that the need for the full 6-lane roadway will be realized in fifteen to twenty years. The savings realized today will be offset by the cost of widening the bridge in the near future.

The cost for widening a bridge, on a per-square-foot basis, is higher than the cost of constructing a new bridge. The following table compares the cost associated with constructing a 6-lane bridge with the cost of constructing dual, 2-lane bridges and widening to a 6-lane bridge in the future.

	Area (ft ²)	Unit Cost (per ft ²)	Cost Today	Interest & Inflation	Cost in 15 years
<u>6-Lane Bridge</u> 118'-5" X 380'	45,000	\$95	\$4,275,000		

<u>2-Lane Bridges</u> 2 – 42'-10" X 380'	32,551	\$95	\$3,092,000		
Initial Savings			\$1,183,000	5% per year for 15 years	\$2,459,000
<u>Widening</u> 36'-0" X 380'	13,680	\$110	\$1,505,000		\$3,129,000
Total Savings (Loss)			(\$322,000)		(\$670,000)

The initial savings is \$1,183,000. Assuming 5% interest and inflation for the next 15 years, the savings will not be enough to cover the cost of the widening. Therefore, over the design life of the project, there is no cost savings.

The width calculations used to derive these costs differ slightly from those included in the VE Study, and they are summarized in C-1(A) above.

Unlike the Norfolk Southern Railroad site, there is enough room to build the entire width of the left bridge while maintaining traffic on the existing bridge. However, the right bridge must still be constructed in a second stage, thereby realizing no reduction in construction time as indicated in the VE Study.

Other factors that must be considered include design costs of the future widening as well as additional environmental impacts associated with a second construction project over and around Pates Creek. These factors coupled with those outlined above were discussed and evaluated by the design team, GDOT and Henry County. Henry County has determined that the benefits of constructing the full 6-lane bridge as part of this project warrant the increased construction costs.

Idea C-2: Reduce the elevation of the Pates Creek Bridge and the approaches

*The design team's recommendation is to **implement** this idea.*

The design team explored this idea while the VE Study was in progress, and it was determined that the proposed profile over Pates Creek should be lowered. Through coordination with the bridge design and hydraulics engineers, the proposed profile was lowered by 5'-7½". This results in an increase over the existing bridge elevation of approximately 2'-4".

Idea C-4: Construct separate multi-use bike/pedestrian path bridges alongside the proposed bridges over the Norfolk Southern Railroad and Pates Creek in lieu of bike lanes and sidewalks on the proposed bridges

*The design team's recommendation is to **not implement** this idea since it requires replacing the proposed bike lanes with a multi-use path on the south side of the alignment. Please see A-9 above for a discussion of this idea.*

Idea F-1: Construct dual single span bridges with vertical abutments and MSE walls in lieu of a 3-span, single 6-lane bridge over the Norfolk Southern Railroad

The design team's recommendation is to not implement this idea. However, the design team recognized the validity of this idea, and therefore expanded it to evaluate the following options:

Option 1: Construct 3-Span, 6-Lane Bridge

Option 2: Construct 1-Span, 6-Lane Bridge with vertical MSE wall abutments

Option 3: Construct Dual, 3-Span, 2-Lane Bridges and widen in 15 years

Option 4: Construct Dual, 1-Span, 2-Lane Bridges with vertical MSE wall abutments and widen in 15 years

Based on the design team's calculations included in the table on the following page, it appears that the single-span, 6-lane bridge with vertical abutment walls is slightly more cost efficient than the other options. However, Norfolk Southern's existing right of way is 150' wide, and the railroad typical will not allow construction of an MSE wall abutment on railroad right of way. In order then for the MSE wall option to be viable, the bridge span would need to be increased. This would obviously negate the savings associated with the MSE wall alternative. Therefore, the 3-span bridge will be included in the project unless it is determined that Norfolk Southern will allow an MSE wall abutment on railroad right of way, and that GDOT will allow this aspect of the bridge to be constructed off of GDOT right of way.

Option	Item	Area (ft ²)	Unit Cost (per ft ²)	Cost Today	Interest & Inflation	Cost in 15 years
1	<u>6-Lane Bridge</u> 118'-5" X 192'	22,737	\$95	\$2,160,000		
2	<u>6-Lane w/MSE</u> 118'-5" X 84'	9,947	\$95	\$995,000		
	MSE Walls	12,780	\$55	\$703,000		
	Additional Backfill	673 CY	\$110/CY	\$74,000		
	Construction Staging	3,472	\$20	\$69,000		
	Total			\$1,841,000		
3	<u>2-Lane Bridges</u> 2 - 42'-10" X 192'	16,447	\$95	\$1,562,000		
	<u>Widening</u> 36'-0" X 192'	6,912	\$110	\$760,000	5% per year for 15 years	\$1,581,000
	Total			\$2,322,000		\$3,143,000
4	<u>2-Lane w/MSE</u> 2 - 42'-10" X 84'	7,195	\$95	\$684,000		
	MSE Walls	12,780	\$55	\$703,000		
	Additional Backfill	673 CY	\$110/CY	\$74,000		
	Construction Staging	3,472	\$20	\$69,000		
	Piles	1,000 ft	\$60/ft.	\$60,000		
	Cap	16 CY	\$600/CY	\$10,000		
	Temporary MSE Walls	342	\$55	\$19,000		
	Initial Total			\$1,619,000		
	<u>Widening</u> 36'-0" X 84'	3,024	\$110	\$333,000	5% per year for 15	\$692,000

Page 8
Brian Summers
STP-0002-00(638) Henry County
Eagles Landing Pkwy
P.I. No. 0002638
January 9, 2008

	Total	\$1,952,000	years	\$2,311,000
--	--------------	-------------	-------	-------------

Comparisons				
1 vs. 2	Total Savings	\$319,000	5% per year for 15 years	\$664,000
1 vs. 4	Initial Savings	\$541,000		\$1,125,000
	Total Savings (Includes Widening)	\$208,000		\$433,000

The cost calculations included in the table above differ somewhat from the VE study. A list of these differences is included below:

1. As discussed previously, the required width of the dual bridges is 42'-10".
2. The height of the MSE walls would be 31'-0", as opposed to 23'-0", which yields a greater wall area than that used in the VE Study cost calculations.
3. Construction of the MSE walls must be staged with the bridge construction (see C-1(A) above), and the associated cost was not included in the VE study.
4. The VE Study cost estimate omitted the cost of the select backfill material behind the abutment and above the top of the MSE wall, which is a significant amount of material for this project:
 2 bents x 5'-9" high x 79' wide x 20' deep
 = 673 CY of select backfill material (approx.)
5. If the full width of the wall required for the future 6-lane bridge is constructed, it is advisable to drive the piles and construct the cap for the full 6-lane bridge before building the wall. The cost for the additional piles and cap were not included in the VE Study.
6. Consideration must be given to retaining the fill between the bridges before the inside widening is constructed. This could be accomplished by building additional height of MSE wall between the bridges that would be removed later. The cost for the additional, temporary MSE wall height has been included in the table below.

Design Suggestions

A-3: Check the roadway superelevation transition at the Norfolk Southern Railroad bridge

*The design team's recommendation is to **not implement** this design suggestion.*

The proposed Norfolk Southern Railroad Bridge is located on a tangent between reverse curves. The tangent between these curves is long enough to provide a sufficient superelevation transition

by GDOT and AASHTO Standards. However, the bridge's proximity to the first curve prohibits transitioning to and maintaining normal crown across the bridge. Further, development and topography east and west of the bridge prohibits adjusting the roadway geometry to increase the length of tangent. Therefore, the remaining options are to construct a transition across a portion of the bridge or to hold reverse crown across the bridge as currently proposed. The current proposal is to transition from full superelevation of the first curve to reverse crown, hold reverse crown across the bridge, and then transition to full superelevation of the second curve. This option meets the superelevation transition requirements of both curves while maintaining a more "simple" bridge from both the standpoint of design and construction.

A-5(1): Review crossroad access at Trade Center Parkway

The design team's recommendation is to not implement this suggestion.

Construction of a new access roadway between Business Center Drive and Trade Center Parkway is beyond the scope of this project. However, it will be suggested to Henry County as a future project. Due to the heavy volume of truck traffic accessing Business Center Parkway from the west, closing the median opening at Business Center Drive is not a viable option without the new access roadway. Finally, the existing intersection at Trade Center Parkway does not currently warrant a traffic signal.

A-5(2): Review crossroad access at Four M Way

The design team's recommendation is to implement this suggestion.

Review of the proposed access at Four-M-Way is in progress. Four-M-Way is a private driveway, and is currently proposed as a right-in right-out driveway. Due to heavy truck volumes at this location, a full-access driveway would be beneficial. However, other private driveways in the immediate vicinity also have heavy truck volumes, and they too would benefit from a full-access driveway. Henry County is facilitating meetings with the property owners in the immediate vicinity to discuss options to combine these driveways such that they would all benefit from a single median opening in this area.

B-8: The need to replace the new 4-lane roadway section east of SR 42

The design team's recommendation is to not implement this suggestion.

Eagle's Landing Parkway changes names to East Lake Parkway east of SR 42/US 23, and it is currently a 3-lane section from this point to the beginning of the recently completed East Lake Parkway Extension Project. The VE Study Team appears to have misidentified the section as a 4-lane. The proposed project overlaps the recently completed East Lake Parkway Extension project by approximately 675'. This overlap is necessary to make a slight alignment correction

just east of Talon Place, and to complete the raised median that was omitted from the East Lake Parkway project. Therefore, the limits of construction can not be reduced.

K-3: Relocate the recommended (VE Study) multi-use path from the eastbound shoulder to a location off the roadway for a portion of the project

The design team's recommendation is to not implement this suggestion.

This suggestion was evaluated during concept development. In fact at both the Initial Concept Team Meeting and the Concept Team Meeting, a 10' multi-use path with no concurrent roadway bike lanes was included in the conceptual layout and was discussed. However, GDOT personnel were concerned about the risk of transitioning off of the roadway shoulder, to the bottom of the fill slope, and then back onto the shoulder. Their major concerns were maintaining ADA compliance and the safety of combining pedestrian and bicycle traffic. Further, this recommendation requires replacing the proposed bike lanes with a multi-use path on the south side of the alignment. Please see A-9 above for a discussion of this idea. It was decided that the proposed project would include bike lanes concurrent with the roadway pavement and standard sidewalks along both roadway shoulders. This project will not preclude the construction of a meandering, multi-use path adjacent to The Villages under a separate project.

The design team has conducted additional studies and has evaluated the eight "Creative Ideas" and five "Design Suggestions" based on these studies. The design team recommends the implementation of one of the "Creative Ideas" (C-2), and one of the "Design Suggestions" (A-5(2)). If additional information is needed, please contact Jan C. Hilliard, Office of Urban Design, at (404) 656-5441 or Chris Marsengill, McGee Partners, at (770) 938-6400.

JBB: JCH